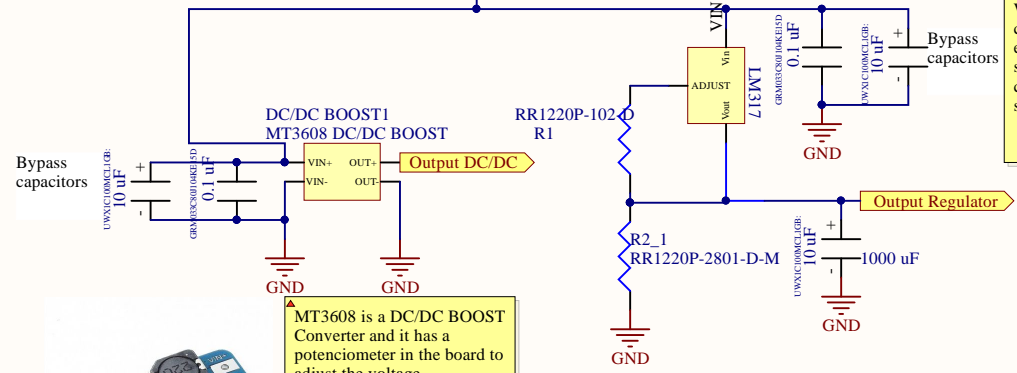


▲ LM317 is a voltage Regulator and the output Voltage is:  
 $V_{ref} * (1 + R2/R1)$  where  $V_{ref} = 1.25 V$   
 Then  $V_{out} = 4 V$

- LM317:
- It is a voltage regulator controlled by two resistors.
  - Output Current: 2.2 A
  - Input Voltage: 4,2 - 40 V
  - Output Voltage: 1.2 - 37 V
  - Power: 100 W

▲ We use two bypass capacitors, the electrolytic capacitor supports 16 V and the ceramic capacitor supports 6.3 V.



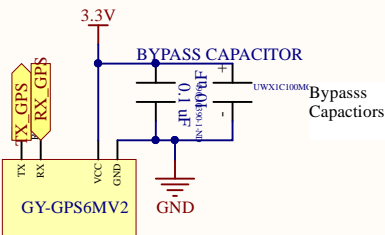
▲ We use two bypass capacitors, the electrolytic capacitor supports 16 V and the ceramic capacitor supports 6.3 V.



▲ MT3608 is a DC/DC BOOST Converter and it has a potentiometer in the board to adjust the voltage.  
 How the voltage input of the arduino is between 7 and 20 V we use 8 V.

BOOST CONVERTER  
 tage: 2- 25 V  
 maximum Output Voltage: 28 V  
 Output Current: 2 A  
 Efficiency: 93%

▲ We have supplied it with the same voltage than the SIM800L and we have connected the digital pins to the Arduino.



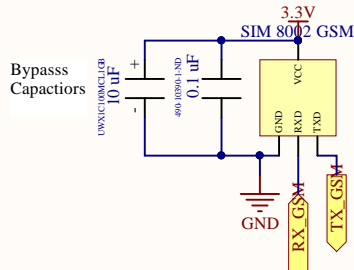
▲ We use two bypass capacitors, the electrolytic capacitor supports 16 V and the ceramic capacitor supports 6.3 V.

GPS  
GPS NEO6MV2:  
Input Voltage: 3 - 5 V  
Speed: 9600 bps

Title <b>Proyecto INtegrado</b>			* * * *
Size: <b>A4</b>	Number:3	Revision3	
Date: 22/01/2020	Time: 1:33:55	Sheet2 of 7	
File: C:\Users\geeme\Desktop\Ingenieria\4º Curso\Primer cuatrimestre\Tecnologia de Circuitos Impresos\Proyecto Integrado\			



▲ We use two bypass capacitors, the electrolytic capacitor supports 16 V and the ceramic capacitor supports 6.3 V.



▲ The input Voltage is between 3.7 and 4.4 V, we have used a Regulator because it can need currents until 2 A and the Arduino can supply so much current.

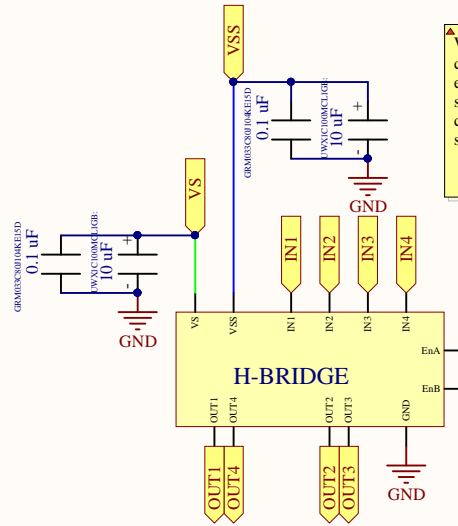
GSM 8001:  
 Input Voltage: 3.7 - 4.4 V  
 Peak currents until 2 A  
 Dimensions: 2.5 cm x 3.5 cm



Title <b>Proyecto Integrado</b>		
Size: <b>A4</b>	Number: <b>3</b>	Revision: <b>2</b>
Date: <b>22/01/2020</b>	Time: <b>1:33:55</b>	Sheet <b>3</b> of <b>7</b>
File: <b>C:\Users\geeme\Desktop\Ingenieria\4º Curso\Primer cuatrimestre\Tecnologia de Circuitos Impresos\Proyecto Integrado\Proyecto Integrado.P</b>		

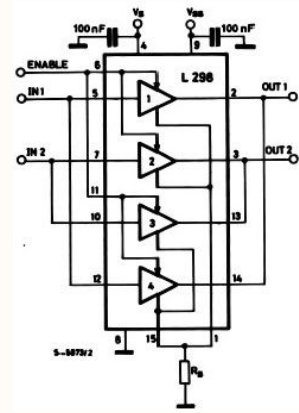
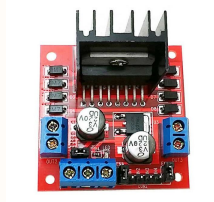
\*  
 GRANADA  
 GRANADA  
 \*





We use two bypass capacitors, the electrolytic capacitor supports 16 V and the ceramic capacitor supports 6.3 V.

The supply is to the battery because the H-Bridge could need a high current and the digital supply is in the Arduino. To higher currents the outputs have been paralleled.

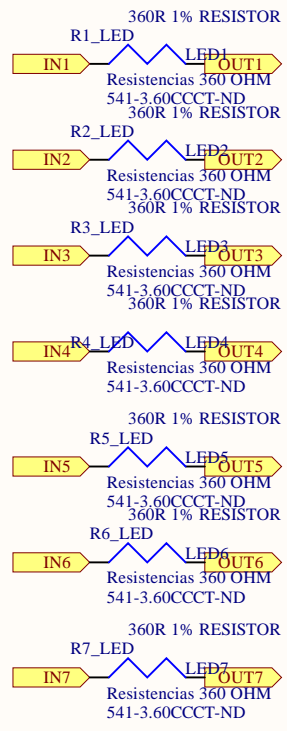


Title <b>Proyecto Integrado</b>		
Size: <b>A4</b>	Number: <b>3</b>	Revision: <b>3</b>
Date: <b>22/01/2020</b>	Time: <b>1:33:55</b>	Sheet <b>4</b> of <b>7</b>
File: <b>C:\Users\geeme\Desktop\Ingenieria\4º Curso\Primer cuatrimestre\Tecnologia de Circuitos Impresos\Proyecto Integrado\</b>		

\*  
**GRANADA**  
**GRANADA**  
 \*



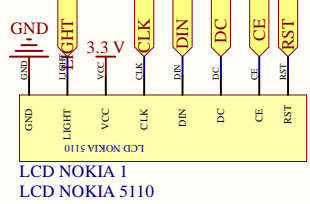




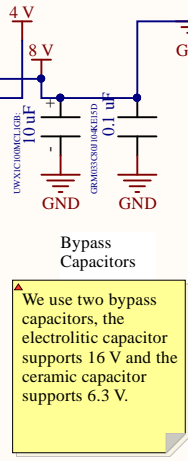
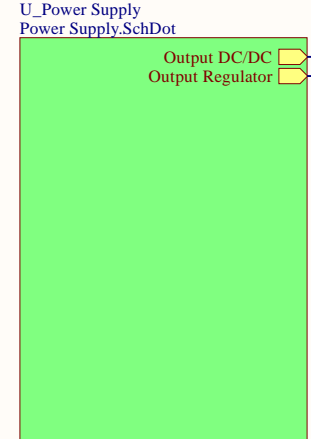
The ship has 7 LEDs, we supply that LEDs with the digital pins from the Arduino and we use it this resistors to connect them.



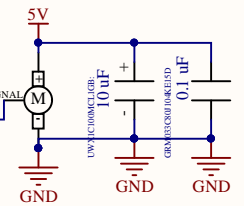
We use the LCD Nokia 5110 to information about the code though we won't use it in our PCB. We supply it with 3.3 V from the Arduino.



# ARDUINO MEGA



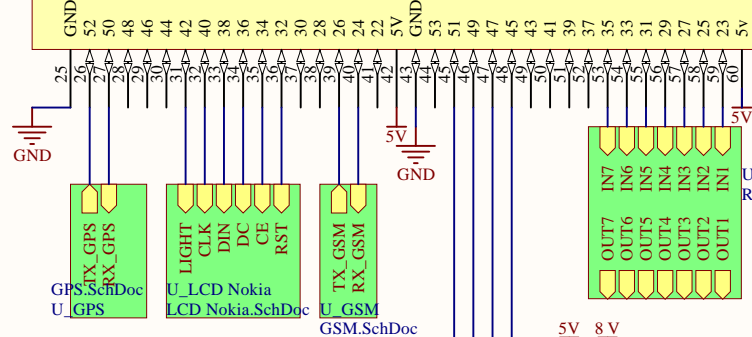
El servomotor será controlado simplemente con una entrada PWM, este está conectado a los 5 V del arduino y variando el duty de la señal PWM controlaremos la dirección de este.



Bypass Capacitors

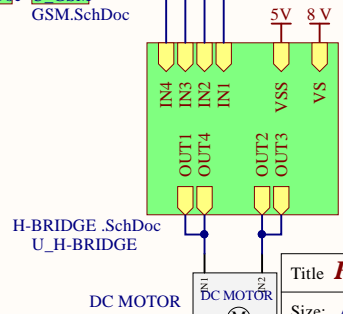
We use two bypass capacitors, the electrolytic capacitor supports 16 V and the ceramic capacitor supports 6.3 V.

We control when this LEDs are on or off using the digital pins from the Arduino.



GSM, GPS and LCD modules will be connected to digital pins from Arduino to control them.

H-BRIDGE will be connected to the digital pins from Arduino to control the motor and we connect the H-BRIDGE to 8 V (from the DC/DC) Converter and the digital input to 5 V.



Title <b>Proyecto Integrado</b>			* GRANADA GRANADA
Size: A4	Number: 5	Revision: 4	*
Date: 22/01/2020	Time: 1:33:56	Sheet 7 of 7	*
File: C:\Users\geeme\Desktop\Ingenieria\4º Curso\Primer cuatrimestre\Tecnologia de Circuitos Impresos\Proyecto Integrado\...			



ARDUINO\_MEGA1

10 uF

DC/DC BOOST1

0.1 uF

LM317

R1

R2\_1

10 uF

2

10 uF

SIM1

0.1 uF

10 uF

GPS1

MAX258N

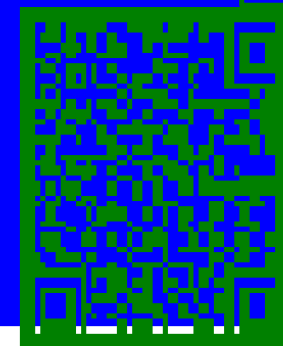
0.1 uF

10 uF

0.1 uF

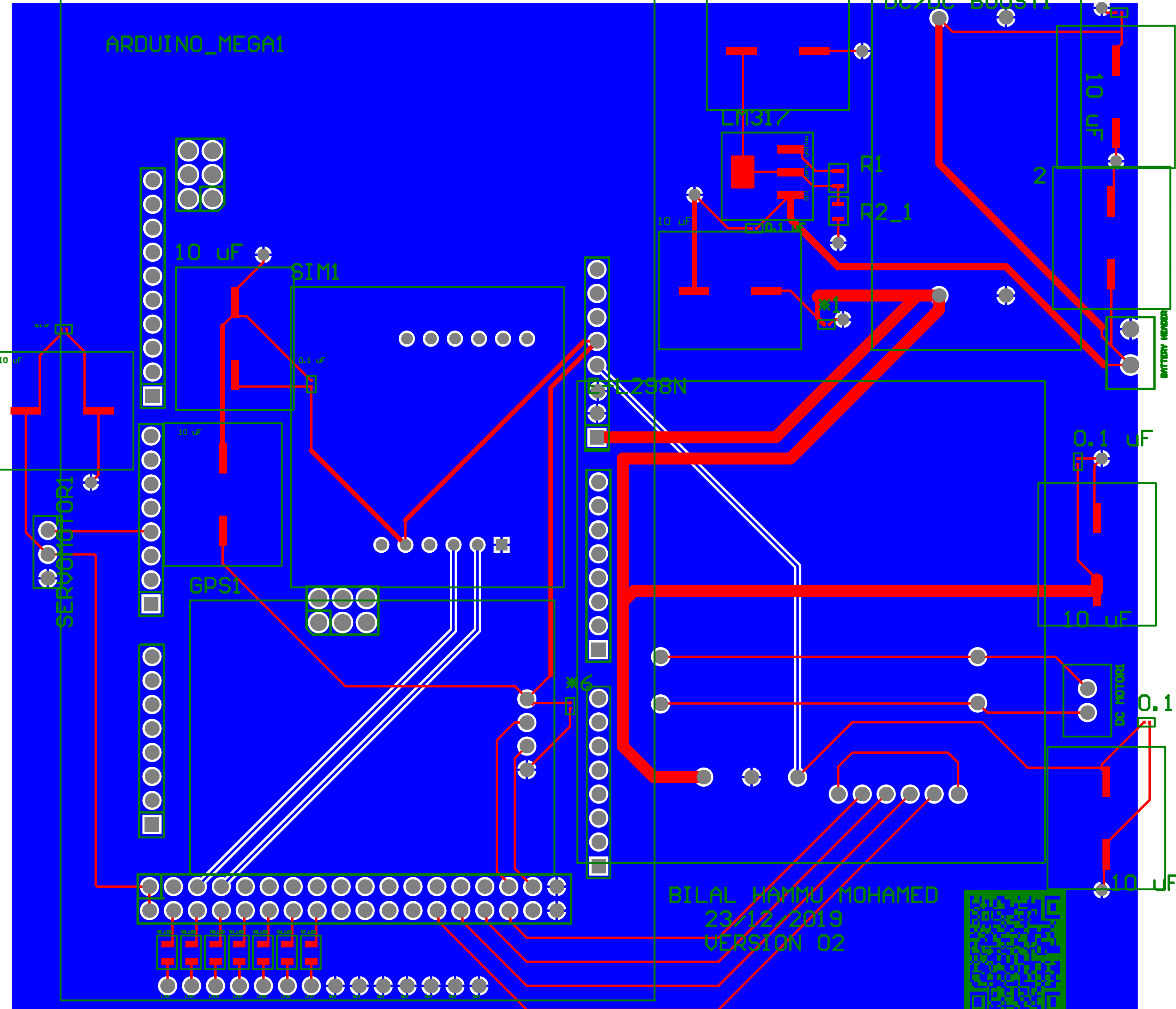
10 uF

BILAL HAMMU MOHAMED  
23/12/2019  
VERSION 02



BATTERY HEADERS

DC HEADERS



ARDUINO\_MEGA1

10 uF

SIM1

10 uF

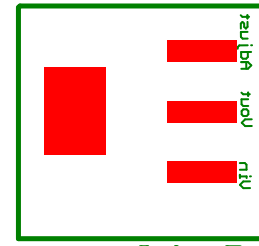
GPS1

10 uF

+

-

LM317



10 uF

-

+

0.1 uF

\*1

DC/DC BOOST1

0.1 uF

10 uF

+

-

2

-

+

BATTERY MODULE

F-L298N

0.1 uF

-

+

10 uF

DC MOTOR1

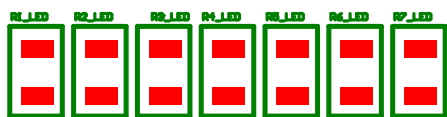
0.1 uF

+

-

10 uF

BILAL HAMMU MOHAMED  
23/12/2019  
VERSION 02



LED1 LED2 LED3 LED4 LED5 LED6 LED7 GND GND GND GND GND GND GND

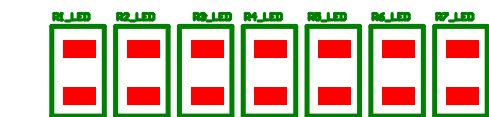
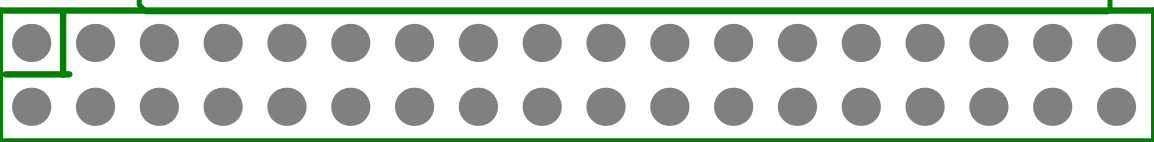
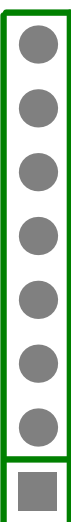
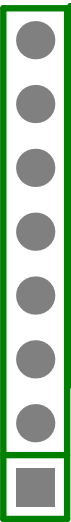
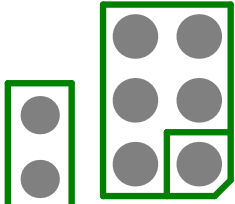
0.1 uF

10 uF

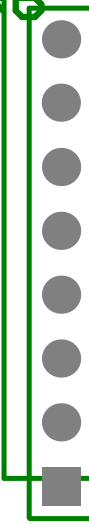
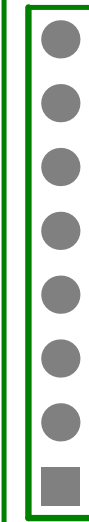
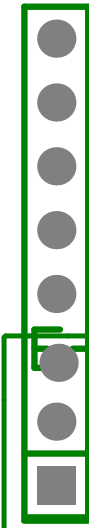
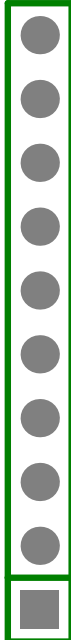
+

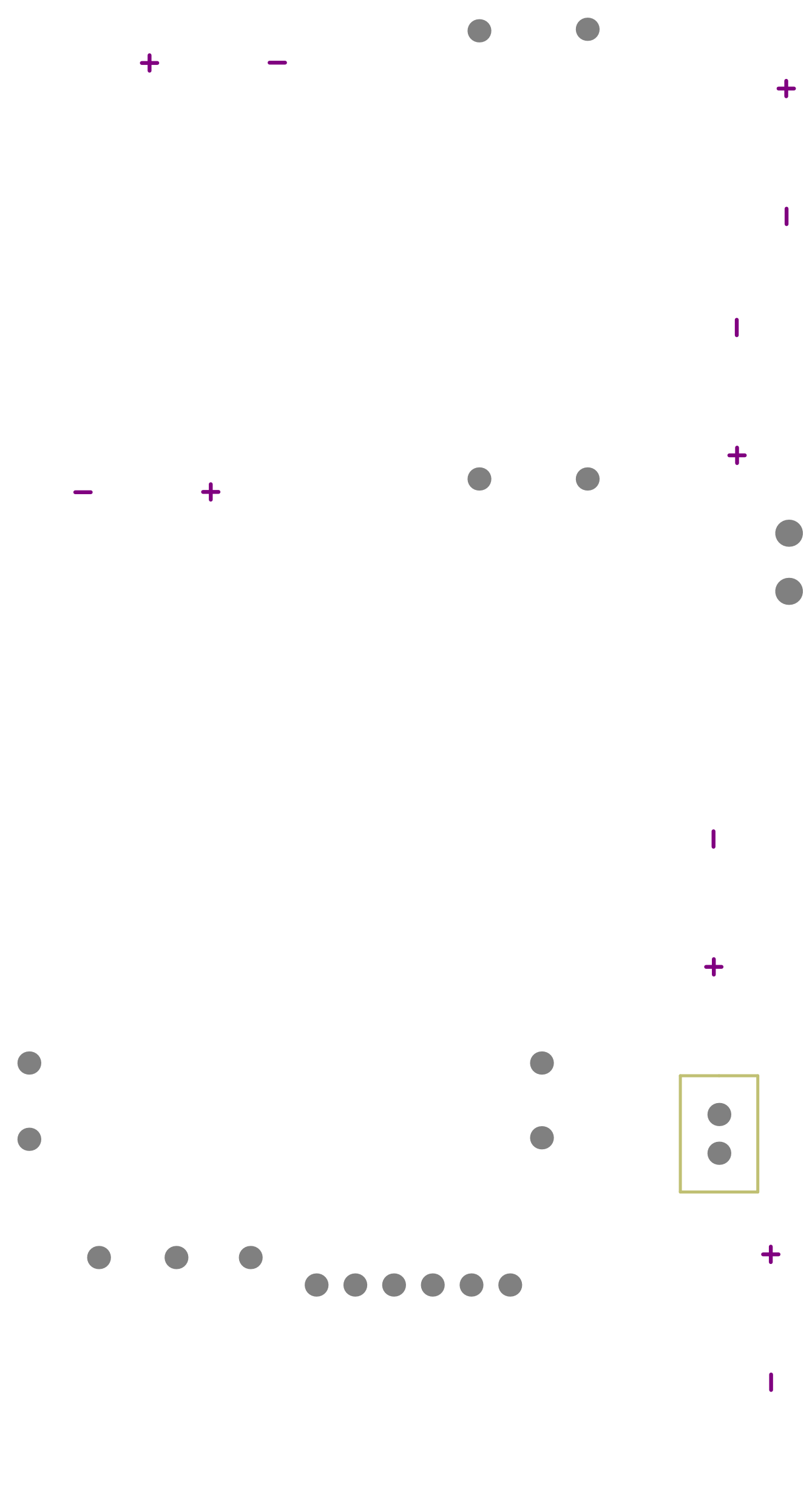
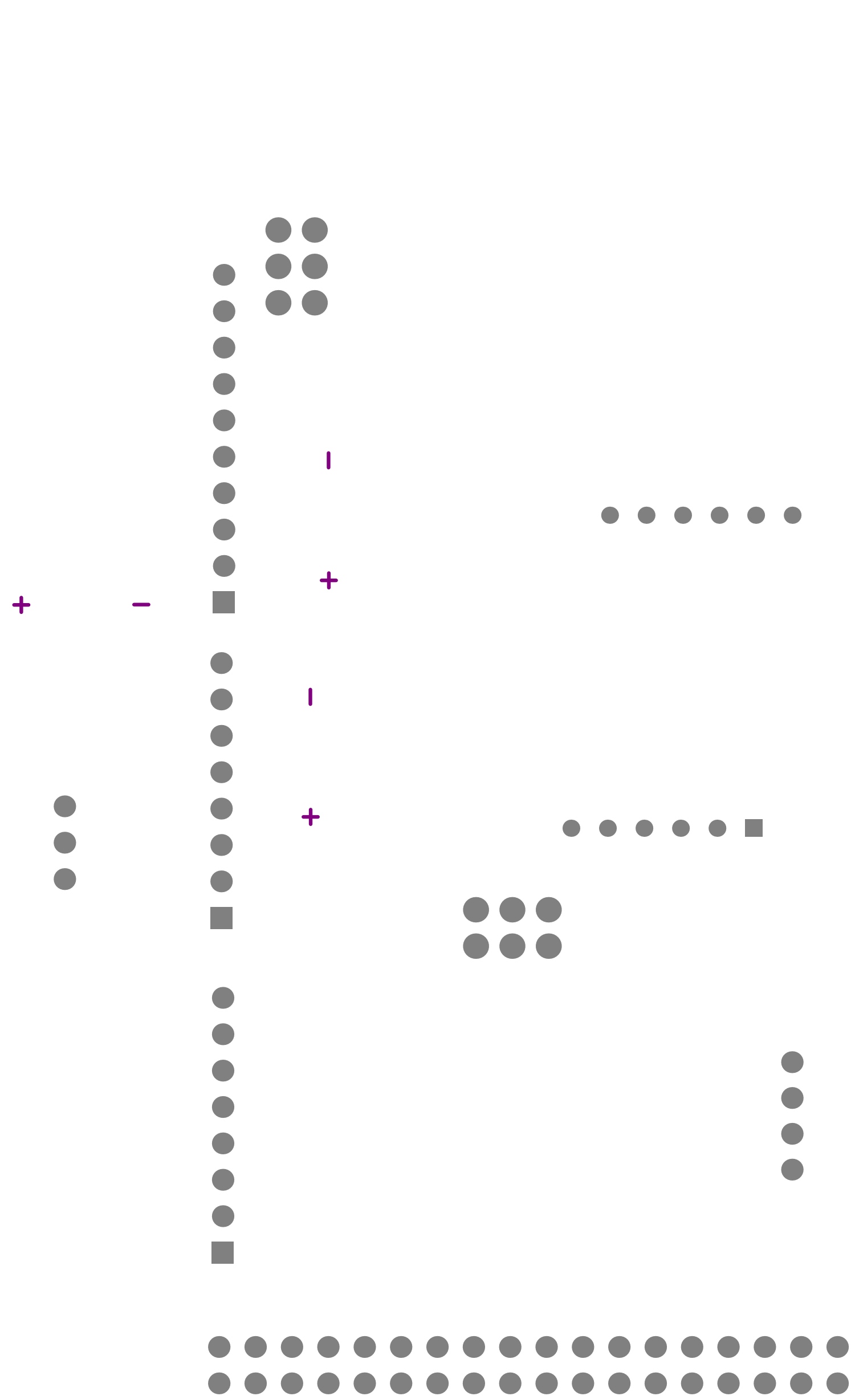
-

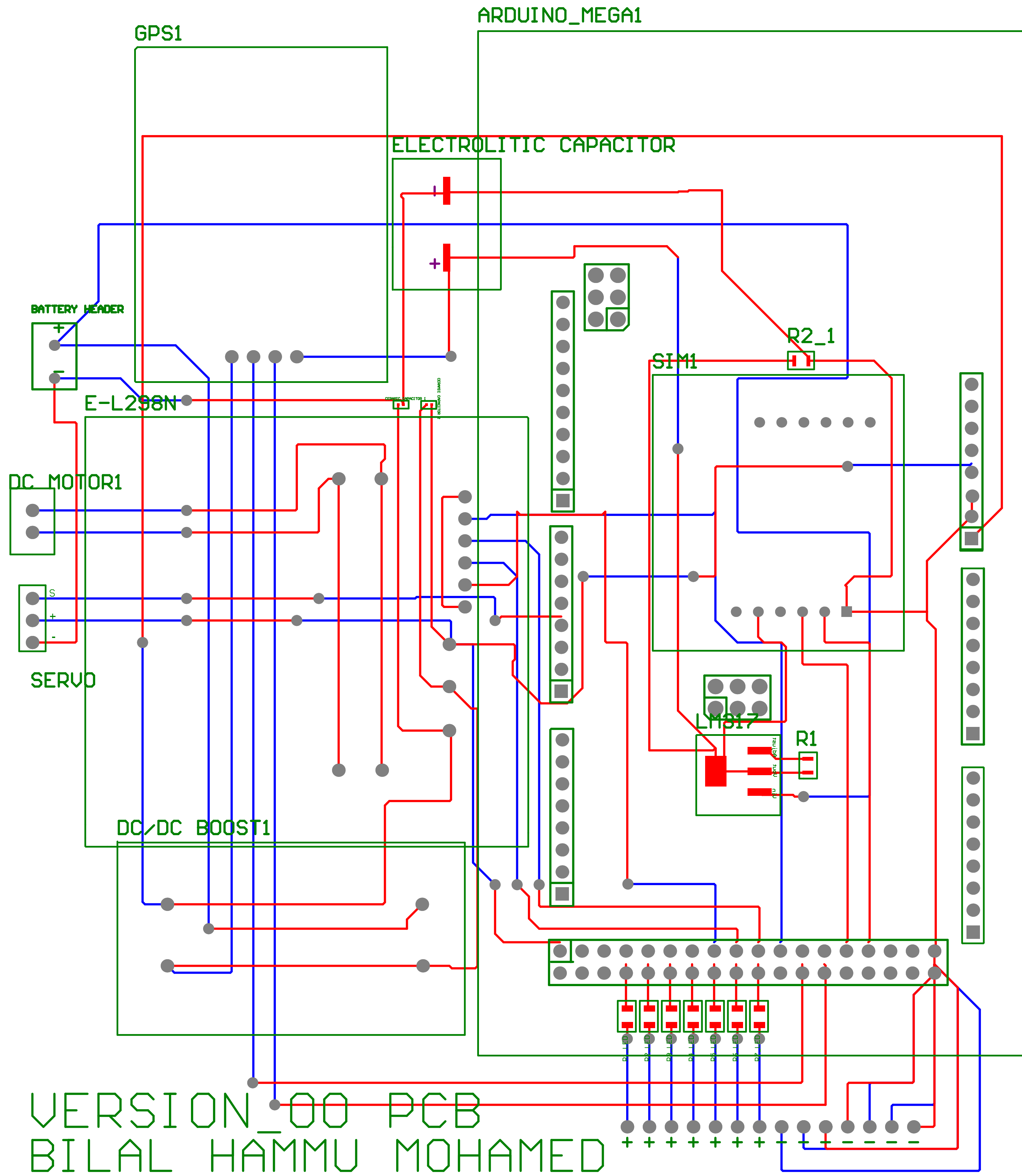
SERVOMOTOR1



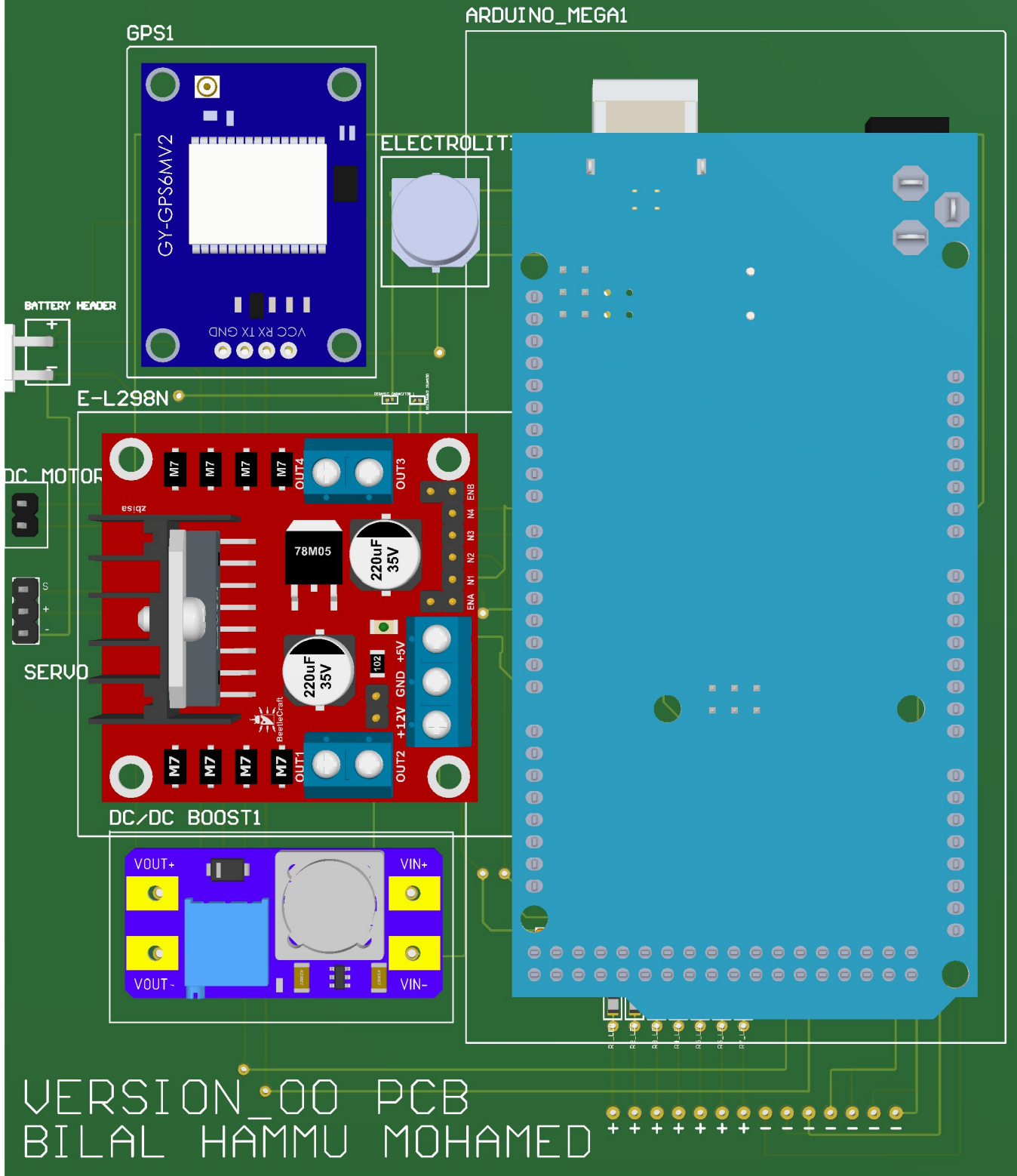
LED1 LED2 LED3 LED4 LED5 LED6 LED7 GND GND GND GND GND GND GND







VERSION\_00 PCB  
 BILAL HAMMU MOHAMED



VERSION\_00 PCB  
BILAL HAMMU MOHAMED







Comment	Description	Footprint	LibRef	Quantity
GRM033C80J104KE15	CAP CER 0.1UF 6.3V	Capacitor	GRM033C80J104KE15	8
UWX1C100MCL1GB	CAP ALUM 10UF 20%	Electrolitic Capacitor	UWX1C100MCL1GB	9
ARDUINO_MEGA SCHEMATIC		ARDUINO MEGA	ARDUINO MEGA	1
Conector_Batería		BATTERY HEADER	Conector_Batería	1
DC MOTOR		DC MOTOR	DC MOTOR	1
MT3608 DC/DC BOOST		MT3608	MT3608 DC/DC BOOST	1
E-L298N	Dual Full Bridge Motor	L298N	E-L298N	1
GPS		GPS Module	GPS	1
LCD NOKIA 5110			LCD NOKIA 5110	1
LM317D2T-TR	STMICROELECTRONI	LM317	LM317D2T-TR	1
RR1220P-102-D	RES SMD 1K OHM 0.5	RR120	RR1220P-102-D	1
Resistencias 360 OHM		R_LEDS	Resistencias_LED	7
RR1220P-2801-D-M	RES SMD 2.8K OHM 0	RR120	RR1220P-2801-D-M	1
900-00005	GEARMOTOR 6VDC S	PINES SERVOMOTOR	900-00005	1
SIM8002 GSM		GSM SIM800L	SIM8002 GSM	1